



Delaware State Fire Commission

F.I.R.E. TEAM Incident Report



Executive Summary

On Tuesday, June 25, 2024, a 25-year-old volunteer firefighter was injured while conducting overhaul with a Halligan Bar. At 2154 hours, Kent County Communications Center (Kent Center) dispatched Citizen Hose, Clayton, Leipsic, and Cheswold Fire Company to a report of a residential structure fire. At 2203 hours, Engine 45 (Clayton Fire Company) arrived on the scene reporting heavy fire showing through the roof of the residence.

Command was established and firefighters entered the structure to extinguish the fire. The firefighter arrived in his company's command vehicle and donned his protective gear (turnout gear) and self-contained breathing apparatus (SCBA) and reported to command for his assignment. This firefighter was instructed to report to Division Two where he was given the assignment to perform special services duties. The firefighter was utilizing a Halligan Bar to strike and pull the ceiling and while doing so was standing directly underneath the ceiling. This caused falling debris to land on the exposed area of the firefighter's wrist. The firefighter immediately felt that he was burned and notified command and was removed from the structure. The firefighter was treated by on-scene medical personnel and transported to Kent General Hospital for further treatment.



Contributing Factors

- The injured firefighter was wearing a jacket manufactured in 2008 and it did not have wristlets with thumb holes or loops.
 - The injured firefighter was wearing structural firefighting leather gloves without extended cuffs.
 - The firefighter used a Halligan Bar to pull the ceiling directly over their head.
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Key Recommendations

- Key Recommendation 1: Firefighters should only wear departmental issued gear that are within NFPA 1971 standards. Should the firefighter/member deviate or alter from wearing the standard departmental issued NFPA 1971 compliant turn out gear, the fire company puts the members and the company at risk for physical injury and potential liability. Fire departments should ensure all firefighters are within NFPA standards when issuing and wearing protective gear. [NFPA 1971]. The injured firefighter was issued turnout gear, which was within NFPA standards however, this gear was kept at the fire department while he possessed expired gear to utilize when responding to scenes while assigned as a duty officer.
- Key Recommendation 2: Fire departments should ensure firefighters utilize proper equipment on fire grounds and follow proper training and standards when overhauling. DSFS training curriculum, IFSTA, 7th edition, Chapter 15, instructs that when pulling ceilings that appropriate tools should be used like pike poles. Do not stand directly under the area to be opened.
- Key Recommendation 3: Although not a requirement per NFPA, departments should consider purchasing turnout coats where the wristlets have thumb holes/loops to prevent the wristlet from rising away from the intended protection area of the wrist. [NFPA, 2018 edition, 1971, 6.1.9.2.1]
- Key Recommendation 4: Utilize firefighting gloves with extended cuffs when the turnout coat does not have wristlets with thumb holes or loops.
- Key Recommendation 5: National Fire Protection Association 1971, A.7.2.1 recommends that the fire company consider providing each member with two complete sets of structural fire-fighting protective clothing that meets the requirements of NFPA 1971 whenever possible. The injured firefighter was issued current turnout gear however, the firefighter possessed expired gear to utilize as secondary turnout when being assigned as the duty officer while his primary turnout gear was kept at the fire department.



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Introduction

On June 25, 2024, at 1051 hours, Chief Investigator Truax was notified by Kent County Communications that a firefighter was transported to Kent General Hospital after receiving burns to his wrist areas. Members of the Fire Commission's F.I.R.E. Team responded to the scene of the incident while the mental health administrator responded to the hospital. Investigators documented the scene including taking ground and aerial photographs. During the investigation, investigators interviewed the injured firefighter, his department's fire chief, and the deputy fire chief. Investigators reviewed the following documents: Kent County CAD report, radio transmissions, and fire school training transcripts. The focus of the report is to determine the following: the root cause of the injury, if current training or standards were used by the firefighter(s), if the proper protective gear was utilized, and whether there was a command-and-control function.

Fire Department

The fire company serves as 1 of 63 volunteer fire companies servicing the state of Delaware. This fire company is volunteer however, the company does employ part-time employees to assist in daily operations, mostly staffing their two ambulances. The fire company has operated since 1947. The fire department operates several pieces of apparatus, Tanker 53, Squad 53, Rescue 53, Brush 53, several marine units, two BLS units, and a command vehicle.

Training and Experience

The state of Delaware has the following requirements for volunteer firefighters. These requirements must be completed before an individual is allowed to participate in emergency responses and incident scene operations. Delaware Fire Regulations, Chapter 7, 1.0, minimum training requirements require the following training.

- Minimum training is required to ensure firefighters can safely and adequately perform functions at emergency scene operations. Fire Companies are required to track and maintain training records for all members. Members shall only be assigned duties commensurate with their training.
- For members to perform independently or as a part of a team, they must have successfully completed the Delaware State Fire School curriculum or an

approved equivalent training of basic fire skills, structural skills, hazmat response skills, and vehicle rescue.

- Members not yet trained at these levels must be closely supervised by trained members when operating at scenes. Members who are not trained in structural fire skills shall not be assigned interior duties at structural fires and may only participate as support personnel.
- Sufficient equivalency of training shall be determined by the Commission through the Director of the Delaware State Fire School (DSFS).

The Delaware State Fire School offers 16 different certifications through the National Board on Fire Service Professional Qualifications (Pro-Board) and the International Fire Service Accreditation Congress (IFSAC).

The following are certifications for firefighters and fire officers:

DELAWARE FIRE FIGHTER I

- Basic Firefighting Skills (36 hours) or Fire I
- Structural Firefighting Skills (24 hours) or Fire II
- Hazardous Materials Response Skills or Fire II or Hazardous Materials I or II
- Fire Fighter Self-Survival
- Vehicle Rescue
- Fire Fighter First Aid or Emergency Medical Technician (EMT)
- Or Pro-Board/IFSAC – Fire Fighter I plus – EMT

DELAWARE FIREFIGHTER II

- Delaware Fire Fighter I PLUS
- Firefighting Foam
- Rope Rescue I or Ropes and Rigging
- Arson Awareness or National Fire Academy's, Arson Detection for the First Responder
- Rapid Intervention Training - Introduction
- Crew Leader or Fire III AND
- 4 Electives from list or Pro-Board/IFSAC – Fire Fighter II plus Crew Leader and 4 electives.

DELAWARE FIRE OFFICER LEVEL I

- Delaware Fire Fighter II PLUS
- Emergency Vehicle Operator (EVO)
- Driver Operator or Pumps
- DSFS Fire Officer I Course or Company Officer Course / Skills or Strategy AND

- 3 Electives from list or Pro-Board/IFSAC – Fire Officer I plus EVO and 3 electives

DELAWARE FIRE OFFICER LEVEL II

- Delaware Fire Officer Level I

DELAWARE ADMINISTRATIVE OFFICER I

- NFA - Leadership I
- NFA - Leadership II
- NFA - Leadership III AND
- 4 Electives from any list of electives

APPARATUS OPERATOR I

- Delaware Fire Fighter I or Introduction to Emergency Services
- DSFS Driver Operator Course
- Emergency Vehicle Operator Course
- Emergency Vehicle Operator Competency Course

The Leipsic Fire Company requires that in order for an individual to become a regular probationary member they must be 18 years or older and must provide a current criminal background check. Ages 14-17 may become junior members with parental consent and with no convictions listed in the Delaware Volunteer Firemen's criminal history affidavit and will be under the direct supervision of the Fire Chief.

To become a fire line officer the following requirements must be met:

Fire Chief

- Have held any fire line office for at least two years
- Completed Fire Officer II
- Active membership for five years
- And be 21 years of age

Deputy Fire Chief

- Have held any fire line office for one year
- Completed Fire Officer II
- Active membership for five years
- And be 20 years of age

1st Assistant Fire Chief

- Completed Fire Officer I
- Active membership for three years
- And be 20 years of age

2nd Assistant Fire Chief

- Completed Fire Officer I
- Active membership of three years
- And be 20 years of age

The injured firefighter from Leipsic Fire Company had the following training and certifications:

- Pro Board Fire Fighter I
- Pro Board Hazardous Materials Operations
- Pro Board Hazardous Materials Awareness
- Fire Officer I
- Basic Firefighting Skills
- Structure Firefighting Skills
- Ropes and Knots
- Smoke Signals
- Search and Rescue Evolutions
- Ladder Evolutions
- Ventilation Evolutions
- Search and Rescue Evolutions
- Hazardous Materials Awareness
- Elevator Rescue
- Water Rescue Evolutions
- Tactical Fire Evolutions
- Forcible Entry Evolutions
- Firefighting Foam
- Vehicle Rescue
- Emergency Medical Responder
- Water Rescue I
- Fireground Operations – Size up
- Firefighter Self Survival
- Advanced Vehicle Rescue
- Engine Company Operations
- RIT training
- Confined Space Rescue
- Radio 101
- Fire Ground Operations- High Rise

- Water Rescue II
- Hazardous Materials Response Skills
- Crew Leader
- Incident Safety Officer
- Trench Rescue Awareness
- Leadership I
- Arson Awareness
- Emergency Operator
- Driver Operator
- Fit Testing
 - As well as numerous in-service trainings

The firefighter has met the minimum training standards to perform the tasks he was completing at the time of injury.

Medical Findings

The 25-year-old volunteer firefighter suffered second degree burns on both his wrists. (See attached photographs).



Right Wrist



Left Wrist



Right Wrist



Left Wrist

Root Cause of Injury

The root cause of this injury was the firefighter used a short-handled Halligan Bar to pull the ceiling directly overhead causing the debris to fall on top of him. A secondary cause was turnout gear which was manufactured in 2008, did not have wristlets with thumb holes or loops. The gloves that were worn were the standard structural NFPA approved leather firefighting gloves without cuffs. The sleeves on the jacket pulled back away from the wrists as the firefighter was poking the ceiling with the Halligan Bar. This gap allowed for exposed skin to be burned and when the ceiling was pulled down, burning materials landed on the exposed wrists of the firefighter causing burns.

When pulling the ceiling do not pull down on the ceiling directly above you. Use the IFSTA technique as taught in the DSFS Structural Fire Fighting Class. This technique is intended for the firefighter to use a tool that will reach far enough out to

pull the ceiling down in front of them, instead of on top of them. Firefighters should wear extended standard structural NFPA approved leather firefighting gloves with turn-out coats that do not have thumb holes or loops.



Were Current Training and Standards Used

International Fire Service Training Association (IFSTA), 7th Edition, Chapter 15, Overhaul Procedures, instructs that when pulling ceilings, one should use pike poles or appropriate tools. In this incident, the injured firefighter was utilizing a Halligan Bar. The training curriculum also instructs not to stand directly under the area to be opened. In this incident, the injured firefighter was standing directly under the area in which the ceiling was being pulled down.

Was Proper Protective Gear Used

National Fire Protection Association (NFPA) 1851, Chapter 10, Retirement, Disposition, and Special Incident Procedures, 10.1.2, states that structure firefighting ensembles and ensemble elements shall be retired in accordance with 10.2.1 or 10.2.2, no more than 10 years from the date the ensembles or ensemble elements were manufactured. In this incident, the firefighter was wearing turnout gear that had a manufacture date of 2008. The manufacture date of the helmet is unknown and is not within NFPA Standards however, did not contribute to the injury.





National Fire Protection Association (NFPA) 1971, Standards on Protective Ensembles for Structure Fire Fighting and Proximity Fire Fighting. Chapter 7, Performance Requirements, Section 7.2,.1.1 Protective Clothing for Structure Fire Fighting. Manufacturers offer different protective garments with different patterns and styling. Therefore, one manufacturer's garment of a given size might not correspond to a different manufacturer's garment of the same size. Even when garments are provided based on fire-fighter measurements, fire departments and individual firefighters should conduct a dynamic fit test, which evaluates the degree of fit of the protective clothing on the firefighter and in particular acts as a check on whether the clothing fits correctly and is neither too tight nor too loose.

A dynamic fit test involves the individual firefighter donning his or her clothing and performing a series of movements to determine whether the clothing provides ease of movement without restriction and does not encumber the firefighter from being excessively loose. Suggested movements per NFPA include the following:

- Reaches overhead and side to side
- Bending forward and side to side
- Squatting and reaching overhead and side-to-side
- Crawling and duck walking
- Climbing a ladder
- Glove dexterity

Although not indicated, we found during the investigation that once the firefighter donned the SCBA and began simulating striking and pulling movements overhead, the turnout coat would retract, pulling the sleeve upwards away from the wrists. Because of the donned SCBA, the shoulder straps would not allow the sleeves to move freely. Each upward striking movement would pull the sleeve further back exposing the firefighter's wrists.

Was Proper Command Structure Utilized

Incident Command was established when the command vehicle arrived along with the captain arriving on scene. There was also a Charlie side (rear of structure) command, Division 1 (first floor) command and Division 2 (second floor) command established.

Was There a Command-and-Control Function

Incident Command received information and requests from the various commands throughout the fire scene.



Aerial drone image A/B Side



Aerial drone image, alpha side



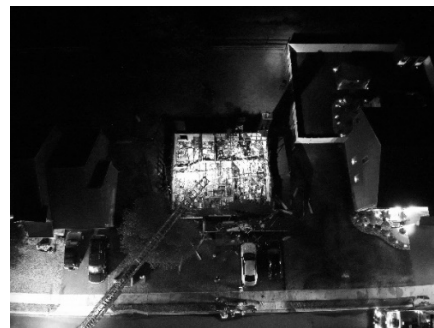
Aerial drone image, roof from alpha side



Aerial drone image, bravo side



Aerial drone view of apparatus & neighborhood



Aerial drone view of roof

References

- NFPA (2018) 1971. Protective Ensembles for structural firefighting and proximity firefighting. National Fire Protection Association.
 - IFSTA – Essentials of Fire Fighting, 7th Edition. International Fire Service Training Association.
 - Department Fire Company Policies
 - Delaware State Fire School Curriculum
 - Delaware State Fire School Training Transcripts
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The objectives of the Delaware State Fire Prevention Commission are to protect the public, specifically, those persons who are the direct recipients of services regulated by this chapter, from unsafe practices. The State Fire Commission shall have the power to investigate injuries to firefighters sustained in the line of duty and issue reports of its findings and conclusions concerning such investigations. The Commission established an investigative team for those purposes known as Firefighter-Investigative-Review-Education ("The F.I.R.E. Team"). The F.I.R.E. Team works in conjunction with the Delaware State Fire Commission Investigators, Delaware State Fire School, Delaware State Fire Marshal's Office, and other necessary agencies that may be needed to complete such investigation.

The program does not seek to determine fault or place blame for the injuries. Rather, the purpose is to determine factors that cause or contribute to firefighter deaths and or injuries sustained in the line of duty. Identification of cause and contributing factors enables researchers and safety specialists to develop strategies to prevent future similar incidents. This report represents a review of the situation at issue and a path forward toward safer practices for Delaware. This report is limited by the information known to the F.I.R.E. Team.